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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,755	09/30/2004	Yuichiro Sugita	43890-690	8140

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Washington, DC 20005-3096

EXAMINER
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VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
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1751

DATE MAILED: 02/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/509,755

Applicant(s)

SUGITA ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 2,3 and 17-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-16 is/are rejected.
- 7) ☒ Claim(s) 11-12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This application is 371 of PCT/JP04/00460 filed 01/21/2004.

Applicant's election without traverse of Group-I, Claims 1 and 4-16 in the reply filed on 01/13/2006 is acknowledged. Claims 2-3 and 17-29 are withdrawn from consideration. This action is made FINAL.

The information disclosure statement (IDS) submitted on 09/30/2004 is in compliance with the provisions of 37 CFR 1.97 and accordingly, the information disclosure statement is being considered by the examiner.

### ***Claim Objections***

Claims 11-12 objected to because of the following informalities: The claim-11 misspells the word 'diglycysile' in line-2 that should be 'diglycidyl.' The claim -12 misspells the word 'glycysile' in lines 2 and 4 that should read as 'glycidyl.' Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The examiner makes of record that instant 12 recite a broad range of components followed by a series of narrow ranges. For examination purposes, the examiner asserts that the narrow ranges recited in instant claims 12 are merely exemplary ranges, and thus, the prior art will be applied against the broadest ranges recited in instant claim 12. Furthermore, the examiner suggests that applicant should delete the narrow ranges from instant claim 12, and add new dependent claims that recite the narrow ranges recited in instant claim 12.

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1. Claims 1, 4, 7-9 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Durand et al (US 5,180,523).

The prior art teaches a conductive cement composition comprising a mixture of two epoxy resins and an admixture of silver particles with a particle size of 1.27-2,540 microns and silver agglomerates with an agglomerate size of 2.0-10.6 microns (Abstract, Col-4, Ln 63-65; Col-5, Ln 1-5). A specific example contained conductive fillers of: (a). silver flakes with a particle size of 0.9-1.3 micron and a surface area of 3-0.6 m<sup>2</sup>/g; (b). silver agglomerates of with a mean size of 4.5 micron and a surface area of 1.62 m<sup>2</sup>/g; and (c). silver powder with a mean particle size of 1.61 micron and a surface area of 1.41 m<sup>2</sup>/g (Col-7-8; Example-1, Table) dispersed in bisphenol-F resin that meets the limitation of claim-1. The degree of agglomeration of the conductive particles is  $4.5/1.61=2.795$  that meets the limitation of claim-4.

With regard to claim-7, the prior art teaches a composition containing 75 wt% conductive particles and 25 wt% epoxy resin (Col-5, Ln 57-59; Col-8, Table).

With regard to claim 8, the claimed % volatile matter in the art paste composition containing Ag particles in bisphenol-F resin will be inherent as evidenced by the disclosure of Kawakita et al that show a volatile content of less than 0.4 wt% for conductive pastes containing silver particles in bisphenol-F type and glycidyl ester type resins (Col-11, Table-2).

With regard to claim-9, the prior art teaches silver particles that are identical to that claimed by the applicants, and identical compositions have identical properties.

With regard to claims 12-13, the prior art teaches a dispersion of silver particles in bisphenol-F diglycidyl ether epoxy (Col-8, Ln 1-41). All the limitations of the instant claims are met.

The reference is anticipatory.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1 and 4-16 are rejected under 35 U.S.C. 103(a) as being obvious over Omoya et al (US 6,139,777).

The prior art teaches the composition of a conductive paste with low viscosity and low volatility for filling the holes comprising 30-70 vol% conductive particles with an average diameter of 0.5-20 micron and a specific surface area of 0.05-1.5 m<sup>2</sup>/g and 70-30 vol% resin (Abstract).

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The prior art is silent about the agglomerates per claim-1, degree of agglomeration per claim-4, two spherical primary particles forming agglomerate per claim 5 and disaggregation of agglomerates per claim-6.

The prior art further teaches making the conductive paste by mixing the components in a three roll mill, wherein the composition, components and process of making the art composition (Abstract, Col-20, Exmpl-5) are similar to that taught by the applicants (Specification: US 2005/0172483; Abstract, Fig-5, Para 0057) and further both the compositions have same utility as hole-filling pastes whereby the presence agglomerates in the art composition would be obvious. The prior art further teaches pastes with a low viscosity of 40 Pa.s for sample-4 in Table-7 (Col-21) containing spherical particles (Fig-5) that is similar to that taught by the applicants, and similar compositions are expected to possess similar properties whereby the claimed agglomerate ratio in claim-4, two particles forming an agglomerate in claim-5, and disaggregation of agglomerates per claim-6 would be obvious in the art paste.

The prior art ratios of components meet the limitation of component ratios in claim-7.

With regard to claims 8-9, the prior art paste composition and components used in making the paste are similar to that by the applicants and similar compositions are expected to possess similar properties.

With regard to claims 10 and 13-16, the prior art teaches conductive particles such as Cu, Ag and Au and their alloys, and particles coated with metals such as Cu, Ag and Au and their alloys, wherein the surface oxygen content is less than 1 wt% (Col-3, Ln 1-19).

With regard to claims 11-12, the prior art teaches glycidyl ester epoxies including dimer acid glycidyl esters (Col-8, Ln 65 to Col-9, Ln 10; Col-11, Ln 30-36) with amine adduct hardeners (Col-13, Ln 34-38).

2. Claims 10-11 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durand et al (US 5,180,523) in view of Omoya et al (US 6,139,777).

The disclosure on the composition of conductive paste as set forth in rejection-1 under 35 USC 102(b) is here incorporated.

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The prior art is silent about the oxygen content per claim-10, specific resin per claim-11 and the conductive particles comprising alloys per claim-14, and metal/alloy coated conductive or non-conductive core particles per claims 15-16.

Omoya et al teach forming low viscosity conductive pastes containing metals such as Ag and Ag-alloys, and Ag or Ag-alloys coated over conductive or non conductive core particles, wherein the surface oxygen concentration was less than 1.0 wt% with low resistance and the use of dimer acid glycidyl esters with amine adduct hardeners with the benefit of low viscosity (Col-3, Ln 1-19, Col-11, Ln 30-36; Col-13, Ln 34-38).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to substitute the conductive fillers of Durand with the conductive fillers of Omoya et al as functional equivalents and/or substitute the resin and hardener of Durand with the dimer acid glycidyl esters and amine adduct hardeners as functional equivalents with reasonable expectation of success to benefit from low viscosity because Durand is concerned about suitable viscosity for screen printing (Col-7, Ln 24-25) and Omoya et al is suggestive of using the composition by printing methods (Col-1, Ln 45-46) and the combined prior art is suggestive of the claimed composition.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8-5.30 Mon-Thu, 8-4.30 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV  
February 14, 2006.

  
**Mark Kopec**  
**Primary Examiner**